

REMARKS

The application has been amended and is believed to be in condition for allowance.

Method claims 6-9 which were withdrawn from consideration have been canceled.

New dependent claims 11-14 are added.

There are no formal matters outstanding.

The previous claims under consideration stand rejected as anticipated by JP 6182518 (JP '518).

Claim 4 has been amended to recite the coil being supplied with a single-phase AC current.

The recitations for new dependent claim 11 are supported at least by Figures 2-3 and specification page 11, line 15 to page 12, line 7. Note that winding coils in the opposite directions mean that the phase is different by 180° with respect to each other.

The recitations of new claims 12-14 are supported at least by Figures 10 and 12 illustrating a continuous current.

The independent claims are believed patentable in that the reference neither teaches nor suggests the features of the claims. Further, the dependent claims are believed to be patentable both for depending from an allowable independent claim and for reciting features of the invention both novel and non-obvious over the prior art.

Applicants attach to this amendment an English-language translation of the JP '518 patent. Certain annotations have been made to the machine translation in order to provide a more appropriate English translation.

JP '518 discloses to apply a discontinuous pulsed DC current ([0029], see also Fig. 2, and [0015]). Therefore, JP '518 does not disclose or suggest AC current or DC current in the normal meaning of these terms. Claims 12-14 introduce "continuous (current)" to emphasize this difference.

Even if JP '518 hypothetically suggested applying AC and DC current, it does not disclose the claimed invention for the reasons below.

JP '518 only shows the example based on hypothetical three-phase AC current ([0012] and Drawing 7), and therefore, fails to disclose a single-phase AC current.

Further, three-phase AC cannot be alternated to a single-phase AC in view of creating circulation flow (Fig. 8(b)) of the molten steel as required in JP '518 ([0002], [0012]). See page 11, line 15 to page 12, line 22 in this application.

See also attached Appendix.

Further, regarding claim 3, JP '518 fails to disclose or suggest the combination of first coil wound on comb-teeth portion of the comb-shaped core for supplying AC current and the second coil wound on the root portion of the core for supplying a DC current.

In JP '518, every electromagnet (at comb-teeth portion according to Fig. 1) is applied with different magnitude of braking field (i.e., static field [0031]) to equalizing the rate of flow ([0004], [0005]). The embodiment in Fig. 11 also indicates a different DC current magnitude for each magnet. The skilled person would not consider alternating with single DC coil that applies every comb-teeth coil with substantially the same magnitude of static field.

Regarding claim 10, the arrangement in JP '518 (see Fig. 8(b)) does not produce an AC magnetic field moving in a longitudinally symmetrical relation from opposite ends to a center of said mold (Fig. 17A of the present application) to prevent the problem shown in Fig. 14 (see page 28, line 20 to page 29, line 3).

Regarding claim 11, the phase difference in JP '518 is 120° (see Fig. 7, for example).

The above remarks identify novel and non-obvious differences between the invention as claimed and the applied reference. Accordingly, applicants believe that it is clear that the invention as claimed is both novel and non-obvious.

Reconsideration and withdrawal of the pending anticipation rejection are respectfully solicited. Allowance of all the claims is also solicited.

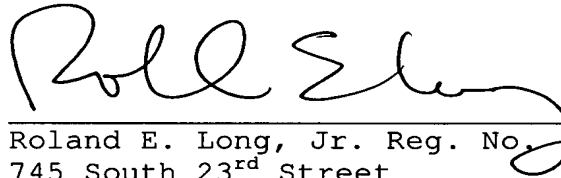
Applicants believe that the present application is in condition for allowance and an early indication of the same is respectfully requested.

Should there be any outstanding issues, it is requested that the undersigned attorney be contacted to arrange an interview in order to resolve these.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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APPENDIX:

The Appendix includes the following items:

- English-language translation of JP 06-182518
- Appendix with annotated Table A1